

We Claim:

1. A flashlight, comprising:
a high-power, directed LED configured to produce a divergent beam of light that is characterized by an optical directivity angle extending from a vertex point; and
a lens having at least a portion that is convergent, being characterized by a focal point, wherein the LED is located such that its vertex point coincides with the lens' focal point.
2. The flashlight of claim 1, wherein the lens is sized and positioned such that substantially all of the directed light from the LED passes through the convergent lens to emerge in a first beam of parallel light.
3. The flashlight of claim 1, wherein:
the divergent beam of light exits the LED through a tip portion; and
additional light exits the tip portion of the LED in a direction extending outside of the beam of light; and
further comprising a parabolic reflector having a focal point, wherein the focal point of the parabolic reflector coincides with the location of the tip portion of the LED so as to cause the parabolic reflector to reflect at least some of the additional light into a second beam of parallel light.
4. The flashlight of claim 3, wherein:
the lens includes a non-convergent portion configured such that light passing through the non-convergent portion of the lens exists the lens at the same angle it enters the lens; and
the second beam of parallel light is parallel to the first beam of parallel light.

5. The flashlight of claim 4, wherein the non-convergent portion of the lens surrounds the convergent portion of the lens.

6. The flashlight of claim 1, and further comprising:

a switch;

one or more battery compartments configured to hold batteries, the battery compartments having contacts that are connected in a circuit that includes the LED and the switch such that the switch can close and open the circuit to energize and deenergize the LED when batteries are installed in the battery compartments; and

a housing configured to house the LED, the lens, the switch and the battery compartments.

7. A flashlight, comprising:

a high-power, directed LED configured to produce a divergent beam of light, wherein the divergent beam of light exits the LED through a tip portion, wherein additional light emanates from the tip portion of the LED in a direction extending outside of the beam of light;

a parabolic reflector having a focal point, wherein the focal point of the parabolic reflector coincides with the location of the tip portion of the LED so as to cause the parabolic reflector to reflect at least some of the additional light into a second beam of parallel light.

8. The flashlight of claim 6, wherein the lens includes a non-convergent portion configured such that light passing through the non-convergent portion of the lens exits the lens at the same angle it enters the lens.

9. An illuminator assembly for insertion into a flashlight having a lens, comprising:
a high-power, directed LED configured to produce a divergent beam of light,
wherein the divergent beam of light exits the LED through a tip portion, wherein
additional light exits the tip portion of the LED in a direction extending outside of the
5 beam of light;

a parabolic reflector having a focal point, wherein the LED is physically held
relative to the parabolic reflector in a position where the focal point of the parabolic
reflector coincides with the location of the tip portion of the LED so as to cause the
parabolic reflector to reflect at least some of the additional light into a second beam of
10 parallel light.

10. A flashlight, comprising:

an illuminator assembly including an LED, a printed circuit board and a
parabolic reflector,

5 wherein components are mounted on the printed circuit board,
wherein the LED is a high-power LED having a filament, a parabolic
micro-reflector and a transparent tip, the LED being mounted in the printed
circuit board,

10 wherein the parabolic reflector is connected to the printed circuit board
such that the focal point of the parabolic reflector coincides with the transparent
tip, and

wherein the parabolic reflector has a flange;
a housing conformingly receiving the illuminator assembly so as to contain the
illuminator assembly within the housing.

11. The flashlight of claim 9, and further comprising a body portion defining one or more battery compartments configured to receive one or more batteries, wherein:
the illuminator assembly is conformingly received by the body portion; and
the housing conformingly receiving the body portion so as to contain the body
5 portion within the housing.

12. The flashlight of claim 9, and further comprising a lens, wherein:
the LED is configured to emit light from its filament and produce a divergent
beam of light that is characterized by an optical directivity angle extending from a
vertex point, and that also produces additional light extending in a direction outside of
5 the divergent beam and emanating from the tip of the LED;

the lens has a first portion that is convergent, being characterized by a focal
point, wherein the LED is located such that its divergent-beam vertex point coincides
with the lens' focal point;

10 the divergent beam substantially passes through the lens' first portion to form
a first parallel beam of light;

the lens has a second portion that passes light without changing its direction; and
the parabolic reflector reflects at least a portion of the additional light into a
second parallel beam of light that is parallel to the first parallel beam of light.

13. A flashlight, comprising:

an LED having a filament, a parabolic micro-reflector and a transparent tip, the LED being configured to emit light from its filament and to emit that light in a divergent beam of light characterized by an optical directivity angle extending from a vertex point, and the LED being configured to also emit additional light extending in
5 a direction outside of the divergent beam and emanating from the tip of the LED;

a means for focusing the divergent beam of light into a first parallel beam of light; and

10 a means for focusing the additional light into a second parallel beam of light;
wherein the first and second beams of light are parallel.

14. A method of focusing the light from an LED having a filament, a parabolic micro-reflector and a transparent tip, the LED being configured to emit light from its filament and to emit that light in a divergent beam of light characterized by an optical directivity angle extending from a vertex point, and the LED being configured to also
5 emit additional light extending in a direction outside of the divergent beam and emanating from the tip of the LED, comprising:

focusing the divergent beam of light into a first parallel beam of light; and

focusing the additional light into a second parallel beam of light;

wherein the first and second beams of light are parallel.